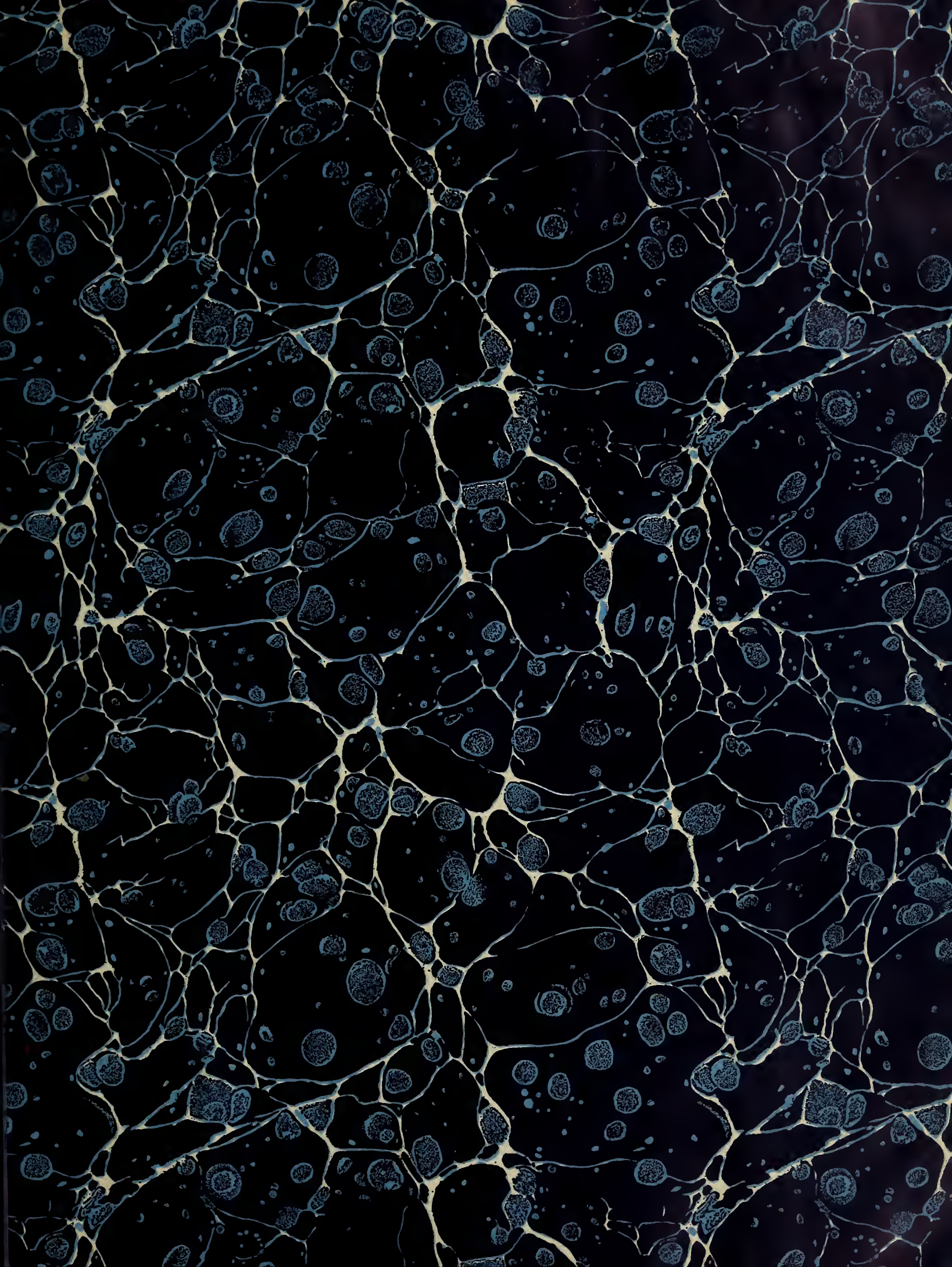

BETTER FRUIT

VOLUME XIII JULY, 1918 NUMBER 1

Special Features in this Edition

ORCHARD IRRIGATION IN THE PACIFIC NORTHWEST

RELATION OF HORTICULTURE TO CANNERIES

PRUNING AND POLLENIZING THE BING CHERRY

WALNUT CULTURE

BETTER FRUIT PUBLISHING COMPANY, PUBLISHERS, PORTLAND, OREGON

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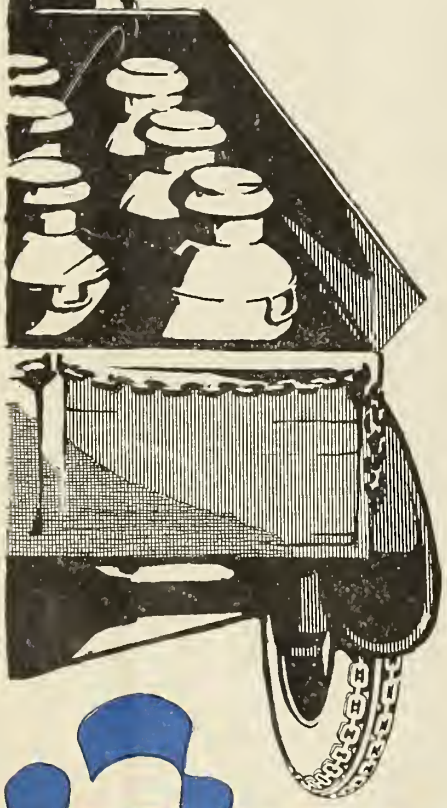

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Proposed Increase in Freight Rates

BECAUSE of the increased freight rate as announced by Director-General of Railroads William G. McAdoo, the fruit growers of the Pacific Coast are facing a crisis. Several meetings have been held throughout the Northwest and California to protest against this increase in freight and to decide what steps to take to have this new rate to the East altered.

As the East is a long haul from the West, it will mean an increase of 10 to 15 cents per box on our apples, giving Eastern competitors an advantage over us, as it will effect them but 2 to 5 cents per bushel at the most. Already the railroads are getting an increased revenue from the apple men by increasing the number of boxes which are now placed in a car. Such industries as live-stock, wool, grain and lumber are paying well—some have increased prices 300 per cent since the beginning of the war, and furthermore on some things the Government is guaranteeing a profit of 10 per cent, whereas apples have about the same values as they did before the war, and growers have had to face an increased cost in production. Fruit must be shipped when ready, and be sold when it reaches market. It is governed by a market condition as governed by the law of supply and demand.

During the period August 15 to December 15, 1917, inclusive, there were shipped out of the Northwest 10,180 cars, containing 8,014,884 boxes of apples, or an average load of 787.7 boxes. These figures were compiled by the Bureau of Markets, U. S. Department of Agriculture. In Table I is shown the districts from which the above mentioned shipments were made, together with the number of refrigerator cars and number of box cars, with average loads.

When the dollar rate to Eastern territory was established apples were practically a luxury and brought prices that could afford any reasonable rate. The dollar rate was established by the carriers because they undoubtedly thought that that was all the traffic would bear. In order to settle the great Northwest the railroads used the prices at which apples were selling as an inducement to settlers, and a very great portion of the Northwestern apple lands were sold to Eastern people, brought here by the railroads themselves.

The apple industry has grown to such an extent that it is one of the largest revenue producers of the carriers. Special equipment was necessary to transport these apples to market and refrigerator cars were built for that purpose. When the rates were established the character of equipment to be used was taken into consideration, for it costs more to make and keep a refrigerator car in condition than an ordinary box car. When the tariffs establishing the dollar rate were made 30,000 pounds was decided upon as a minimum weight, and the tariffs still show that weight. Apples are accepted at what is known as an estimated weight of 49½ pounds per box and a minimum car of 30,000 pounds would be 606 boxes. In order to make even tiers in a car, shippers voluntarily loaded 630 boxes to the car, making a weight of 31,185 pounds.

In Table II is shown the earnings of a minimum load, a 630-box load, a 756-box load, the lowest amount the carriers would receive during the winter of 1917-18; the 787-box load, which was the average of the Northwest during the period August 15 to December 15, 1917, and the 822-box load, which was the average load at Hood River during this period.

It will be seen that the apple industry has already been paying the carriers a decided increase over the minimum earnings and in addition has been forced to accept conditions unknown when the dollar rate was placed in effect. Attention has been called to the fact that when the dollar rate was established the character of equipment was taken into consideration, and attention is also directed to the fact that the character of the commodity was also well known. There was always danger of freezing in transit in the winter, and the carriers provided protection, such as round-housing, etc., and where fruit was frozen carriers paid claims for such damage.

About three years ago the carriers adopted what is known as the "Heater Tariff," which provided two options under which apples might be shipped during the period October 15 to April 15, inclusive. Option 1 reads, "Shipper assumes all risks of frost, freezing or heating in transit," while Option 2 reads, "Carrier assumes all risks of frost, freezing or heating in transit." All shipments under Option 2 carried a tariff charge of $27 per car into dollar rate territory; thus the carriers made a revenue when shipped under Option 2, and refused to accept any risk when shipped under Option 1, this regardless of the fact that the original tariffs on the dollar rate assumed the risks as part of their charge as a common carrier. When the heater tariff went into effect it provided a heater charge under Option 2 as far east as Chicago, but the Eastern lines declined to participate in

Continued on page 22

TABLE I.

	Refrigerator Cars	Box Cars	Average Load
Wenatchee District	3406 (782.8)	1270 (911.3)	817.7
Yakima District	3309 (720.7)	739 (851.5)	745.7
Hood River District	582 (802.3)	168 (890.2)	822.0
Walla Walla, Lewiston, Milton and Freewater Districts	375 (764.5)	83 (950.7)	798.2
Medford, Grants Pass and Gold Hill	218 (776.1)	30 (876.7)	788.3

TABLE II.

Number of Boxes	Weight	Rate	Amount	Excess Earning
606	30,000	1.00	300.00	.....
630	31,185	1.00	311.85	.0395%
756	37,422	1.00	374.22	.2473%
787	38,971	1.00	389.71	.2990%
822	40,689	1.00	406.89	.3563%

TABLE III.

Commodity	Increase in Value	Present Rate Pacific Northwest to Chicago	Proposed Rate Pacific Northwest to Chicago	Recent Minimum Weight Increase
Lumber	70%	$ .53	$ .58	None
Sheep	300%	1.08	1.15	None
Wool	300%	1.00	1.25	None
Wheat	110%	.50	.56	None
Flour	150%	.57½	.63½	None
Sugar	100%	.60	.75	None
Pears and other soft fruits	None	1.25	1.56¼	8%
Apples	None	1.00	1.25	3½ to 17½%

Orchard Irrigation Question in the Pacific Northwest

By R. W. Allen, Hermiston, Oregon

[Editor's Note—This article was written by Mr. Allen when superintendent of Umatilla Experiment Farm. Mr. Allen is now agriculturist on reclamation projects.]

THE methods and practices involved in the irrigation of orchards in the Pacific Northwest, where a wide range of soil, topographical and climatic conditions exist, are continually undergoing changes and improvements. The destructive and costly system of clean cultivation has at last given way to systematic cropping of orchard soils with legumes which produce profitable crops and are valuable as soil builders. This change in soil treatment created a demand for different methods of irrigation in numerous instances, and forced upon many districts more economical use of irrigation water. These changes all appear to be to the best interest of the fruit industry, as with each change has come better and more economical practices.

There are three phases of the operation of irrigating an orchard properly, all of which directly influence the success of the fruit grower. They involve (1) supplying the trees and fertilizer crop with water in correct amount and at the proper time; (2) handling the water in the manner best suited to the water-holding capacity, slope and character of the soil; and (3) economy in the amount of water used and efficiency of labor involved in irrigating.

When clover and other crops are planted in orchards it must be with a realization that they require a liberal supply of moisture, and provision must be made to supply a sufficient amount to satisfy the needs of the fruit and clover crop. To fail in this results in heavy loss of fruit and unsatisfactory growth of the fertilizer crop.

A common error in irrigating orchards is to make the first application of water too late in the spring. This frequently results in the dropping of much fruit; not infrequently the entire crop falls, soon after it is set. Drouth frequently occurs between irrigations where improper care is exercised. Superficial examination of the soil, or an endeavor to judge from the appearance of the trees when they require water, does not convey a correct understanding of the conditions under which the trees are working. The first practice might result in irrigation being applied prematurely, thus resulting in waste of water and time. The second practice invariably results in a measure of drouth existing before the trees show signs of distress. Ordinarily irrigation should be applied before the soil begins to fall apart after being pressed firmly together in the hand. Its falling apart indicates an insufficient quantity of water present to hold the soil particles together, which in turn indicates a scarcity nearly critical to plant growth. Since trees feed to considerable depth, it is important to know that sufficient moisture is present at all times to the full depth of the roots. It is important to irrigate while the soil is yet moist, for then it takes up the water more readily and more uniformly than when it becomes dry. The air in a dry soil gives way slowly to the entering water, thus rendering irrigation much slower than if there is moisture present.

Three causes appear to influence the late use of water. Insufficient attention is paid to the condition of the soil to determine when irrigation should be applied. The occurrence of light showers which do not materially influence the amount of soil moisture is often considered proof that irrigation is not necessary. Inadequate facilities for hastening the operation of irrigating frequently results in a portion of the land becoming badly in need of water before it can be reached. This results from beginning too late, or from using too small a head of water. Considerable loss of fruit has occurred from early drouth, and will continue to occur until earlier irrigation is practiced. This is particularly true where small irrigation streams are used. Larger quantities of water run together would permit the work being rushed, whereas it cannot be hurried with a small stream of water.

The time to irrigate varies so much for different types of soil, and the extent of crop growth, that the practice for each orchard or portion of an orchard becomes a problem in itself. Land upon which heavy vegetable growth is taking place can be irrigated later in the fall than under conditions influencing the removal of little moisture from the soil. Trees carrying heavy crops of fruit should be kept well irrigated up to picking time. They are seldom injured by late irrigation unless it is excessive, as their energy is largely devoted to maturing fruit rather than the growth of branches. When rapid growing trees reach the age at which they should begin fruiting they should be caused to grow slowly, by proper manipulation of the irigating to influence the formation of fruit buds.

The frequency at which water should be applied to orchard soils depends upon the amount they are capable of storing, the extent of loss by evaporation and the quantity required by the crop. When the capacity of the soil to retain moisture is small, as it is in coarse or shallow areas, the length of time it can maintain normal crop growth is proportionately less than for a soil having greater storage capacity. Orchards on coarse, sandy soil require irigation at intervals of ten to fifteen days during the active growing season. Those on silt and clay loam soils of adequate depth require two to four irrigations a year. One irrigation in May or June might suffice on very retentive soils, but it is better practice to irrigate oftener and use less water at each irrigation. In this way a more uniform moisture content of the soil is maintained. Where orchards are found to require irrigation at intervals of two, four or six weeks, it is reasonable to expect that they would require irrigation at approximately half this period when two full crops are drawing from

Figure 1—(*a*) Shallow furrows are desirable for row crops and for starting clover or alfalfa. (*b*) Shallow furrow on left, and comparatively deep furrow on right, showing extent of surface wetting of the soil when water has run for the same time in each.

FIGURE 2—Incomplete distribution of water to the roots of trees. The furrows should be placed evenly over the ground, as all space about trees of this age is occupied by the feeding roots.

the supply. This point is being overlooked at the present time, or is not fully appreciated by many growers, who are placing clover or alfalfa in their orchards. If water is not applied frequently enough, numerous undesirable conditions occur, such as falling of fruit, cessation of growth, which is followed by second growth when irrigation is applied, and weak growth of shade crops. The second growth which frequently occurs on dry trees irrigated during the summer appears late in the fall and causes the ends of the branches, and not infrequently the entire tree, to suffer from freezing in winter.

The fact that numerous orchards are permitted to become in need of moisture between irrigations indicates that fruit growers are frequently unfamiliar with the moisture conditions of the soil, or are neglectful of knowing definitely the conditions under which the trees are working. This condition appears to be more pronounced since clover and other crops have been planted in the orchards than formerly; however, much loss has occurred from drouth in orchards that were considered to have an adequate supply of moisture retained by means of systematic clean cultivation. The proper amount of water to apply depends upon the capacity of the soil to absorb and retain it. It is advisable to apply as much at each irrigation as the soil, to the depth from which the crops are capable of feeding, will hold without loss by drainage. This quantity varies from approximately three inches in depth of water on sandy soil to eight or more inches for silt or clay. The capacity of a soil of any type is influenced by its depth; therefore, the amount of water to apply must be determined by experience for each tract of land.

The method employed for applying water to the soil exerts a decided influence upon the cost and efficiency of irrigating. Whenever possible large heads of water should be used. A great saving in water and labor would result in numerous orchards of the Pacific Northwest if ten to twenty-five times as much water were used for one-tenth to one-twenty-fifth the time that is now used to do the irrigating.

The time and detail necessary to irrigate by means of furrows can be greatly reduced in the average orchard by using borders, or sloping checks, and flooding the surface. (For an explanation of this method of applying irrigation water see Hood River Experiment Station Circular No. 1, page 7; and Umatilla Experiment Farm Circular No. 3, both of which can be obtained at he Oregon Agricultural College.) The method of applying water is necessarily influenced to a great extent by the size of available irrigation head; however, this can usually be increased to advantage by neighbors using the same stream in rotation instead of each taking a continuous flow. It is also influenced by the character and slope of the land and the cropping system pursued. Moderately sloping land having a covering of clover or alfalfa can be flooded, while clean cultivated land requires furrows ranging from numerous and small for sandy land to deep and few for heavier soils. Steep slopes usually can be irrigated satisfactorily by means of deep contour furrows. Deep furrows are preferable for most clean cultivated soils, as a minimum of surface soil becomes wet while irrigating. (Figure 1.) When furrows are used they should be evenly distributed to insure against irregular wetting of the soil. (Figure 2.)

The conservation of soil moisture is greatly fostered by systematic and thorough cultivation. This is important, whether the land is clean or in such crops as alfalfa. The fertility of the soil has a marked influence upon the water requirements of crops, hence it is important for this reason, as well as that of adequate growth of the crops, to keep the soil in a fertile condition. Not only does the water contained in fertile soils give better results on account of the heavier load of dissolved plant-food materials that it carries, but soils made rich by the use of leguminous crops, or other organic fertilizers, are capable of holding much more water than similar soils in a depleted condition. To maintain a high state of fertility in the soil as a practice of water economy, and to create a uniform demand for water each year a rotation system of cropping is very essential. Instead of placing clover in the entire orchard at one time, thus creating a heavy demand for water for a few years followed by a slight demand in years that clean culture is practiced, a portion of the orchard should be kept in crops and a portion in clean culture by changing at intervals of two to four years.

Kill "Barley Taste" by Using Cooking Soda

Let the soda keep company with the bread board the next time you make your barley bread, and you won't have the family exclaiming, "Oh, if only barley didn't have that queer taste."

One teaspoon of soda with six cups of flour will counteract that bitter acid taste to which so many persons object, it has been found in experiments made by home economics workers at the Unisity of Wisconsin.

The taste, it is said, varies with the different brands of flours. Most of the flours which are being milled now contain more of the outer coat of the grain than they did last summer, and consequently have a somewhat stronger flavor than the flours used earlier. Adding a small amount of cooking soda to the dough destroys the taste.

The Yakima Valley Fruit Growers' Association has closed its pools for the 1917-18 crop, showing an average of $1.33 per box to the grower for all kinds, grades and sizes of apples.

Give our boys in the Army and Navy every fighting chance. Pledge yourself to save to the utmost of your ability and to buy War Savings Stamps.

"All the resources of the country are hereby pledged"—now is the time to work them to the limit.

Protect your soldiers with your savings.

Scientifically Pruning and Pollenizing the Bing Cherry

By E. Bowles, Prosser, Washington

SEVERAL years ago we were all talking frost protection; and then a few years later the topic was changed to marketing. Now the current has drifted to pruning and pollenizing. That is the reason for the topic chosen for this article—just to be up to date and in fashion with the cherry crowd. The only claim to originality here is in substituting "Bing" for "cherry." That was done to avoid plagiarism; but what is said in the following will generally apply to the other commercial varieties as well at to the Bing.

If you kill a toad your cow will give bloody milk. This bit of boy philosophy is about on a par with the popular notion of pruning a cherry tree. Thirteen years ago I planted ten acres of cherries; and being a college product I was of course somewhat ignorant. I asked scores of people whether to prune cherry trees, and the verdict was almost unanimous against it. I did some pruning from the first, but shared in the general superstition about the dire evils to follow the cutting of a limb. For years the only severe pruning I did was like the horse doctor with his new medicine—on something "as good as dead." To my great surprise nearly every tree, no matter how bad the condition, came out and made a healthy, vigorous tree. To rejuvenate a sick tree is one of the great benefits of pruning the cherry. In these cases I sacrifice form for vigor—cut away half or sometimes three-fourths of the tree, leaving the branches which show best growth of twigs, and disregarding the form, as that will remedy itself when growth begins. Several of our best trees now have at some time "gone light," as the poultryman says of a hen. The pruning, of course, is only a part of the treatment, but the most important special part.

In addition to helping sick trees, I prune for shape of the tree, for vigor and for size of the fruit. A cherry tree will become too tall for profitable handling as a commercial proposition; so they must be kept down to reasonable height. Most trees should be within the reach of a ten or twelve-foot ladder. In case of a full crop, and by keeping hollow centers, a large part of the crop can be picked from the ground and the bulk of it from short ladders or steps. A hollow top and wide-spreading tree is the only form for a cherry. But do not understand that form is a result of pruning alone. Form is dependent as much or more upon the plant food available and upon the room—that is, the side branches and foliage have the full sunlight. The natural shape of a young well-fed Bing tree is not that of a young Bartlett or Rome Beauty, as some have supposed. The spread will keep pace with the height, and the form tend to that of a ball. If the horizontal twigs grow one foot while the top grows two feet, the round form is maintained, making two feet spread for two in height. Where this proportion is not maintained it is either shortage of available food in the soil or obstruction to the free, full day's sunlight on the side foliage. But this ideal condition does not exist in most cases—semi-starvation for both food and sunlight being the common condition. In these cases, especially the extreme ones, the growth is on the top—merely a stationary base with a story added each year. And these are the cases where the knife must be used severely to overcome the deformity.

The method of pruning must vary greatly from that for the apple. Make as few cuts as possible—cut one large branch rather than a dozen small ones. Often I cut out a six-inch branch; and usually two to four big cuts will cure an old neglected tree. I have done some clipping for several years, but am still somewhat skeptical in regard to it as a general practice—preferring thinning by the heavy cuts and leaving the smaller branches untouched.

Another peculiar rule—cut out the best branch. That sounds silly; but it is this way. A half-starved Bing will often begin to throw its plant food to one big branch, overtowering the other three or four branches which at one time were its equals. If this big branch is cut out at the base—the first fork—the food will distribute well among the remaining branches. If it is clipped and doctored higher up, the trouble is often merely multiplied—a shock of sprouts and continued robbing of the other sections of the tree.

As to time of pruning, that makes little difference. Never clip a branch when the fruit is on, for the purpose of thinning the fruit, as this injures flavor by the removal of foliage on the same branch. Otherwise prune when your saw and work spirit are in good order. Yes, one other exception: clipping immediately after picking forces too much sap into the buds and causes overgrowth in the fall, and sometimes fall blossoms; but removal of whole branches doesn't have this effect so much at that time.

Pollination was not discussed much till the last four or five years, yet no other question is of more importance to the cherry grower. I have heard of no orchard that was planted with any thought on the subject; and the successful orchards are mere accidents by having seedlings or other inferior sorts mixed in. It seems that our three leading varieties—Bings, Lamberts and Royal Anns—do not cross pollenize; and the only way is to have some inferior sorts in the orchard. The first question is: What varieties will fertilize our commercial cherries? Many lists have been named by different authorities — Black Republican, Black Tartarian, Waterhouse, Gov. Wood, also most seedlings. But I do not care what you call your tree, I never use a bud for pollenizing without satisfactory evidence that it is from a tree that has done successful business. The Waterhouse is often recommended as the best market cherry among the pollenizers.

The Bing is our hardest tree to fertilize, because it blossoms first. Nearly all otherwise good pollenizers come out too late for the best work on the Bing; and in an extremely late spring the Bing sometimes is barren of fruit when standing near a tree that in other years causes a full crop. In a horse race, the longer the time the farther they are apart at the end. The Bing is usually three or four days ahead of the pollenizer; and in a late spring six or eight days. With limited success, I have used artificial means to speed up the pollenizer: A few days before blossoming, sheets around the north side of the tree, fires around them on cool nights and even through the day, covering the ground for midwinter and uncovering for early spring.

In planting an orchard, from five to ten per cent should be pollenizers, and these scattered as evenly over the area as possible, never in rows unless the pollenizers can be made of more commercial importance, and then plant twenty per cent or more of them.

I have tried both grafting and budding into old Bing trees to scatter pollenizers, but much prefer the latter. Last year I put in some two thousand buds, scattering them widely where most needed—got from fifty to eighty per cent where I would have been pleased even with twenty per cent. This method aims to raise the efficiency of the pollen several hundred per cent. A large tree that is wholly a pollenizer is probably much under ten per cent effieiency—that is, the bee is moving nearly all the time from one pollenizing blossom to another instead of crossing to the Bing and back and forth where the work will be effective. I began budding July 25 and worked at it occasionally for a month. In most cases the earlier date is safer, as the sap must be running well. One-year-old wood takes the bud best if the twig is large and vigorous, otherwise two-year-old wood did best. Success requires a thrifty condition of the tree receiving the bud. What I call "artificial pollenizing" is a still shorter course to success, and it is a success in a high degree. I have scattered buckets of "posies" through the orchard, hanging the buckets in the trees where needed. A bucket of warm water filled with twigs not more than two feet long—the blossoms half out when taken—will last two to four days and pay big dividends on the time spent. I have also put larger branches in the water ditches or planted them in the wet ground with success. But at last I struck upon a method I believe more practical on a large scale than any of these. I left the pruning of the pollenizers till the trees were blooming, was ready with tools when the bees came in the morning, then worked like a member of the fire squad cutting

large branches by the load and scattering them far and wide among the Bings. These will last several hours—usually as long as the bees are working for one day; for several successive mornings the work was repeated and the same ground covered. One man by this larger method can get many times the results of the smaller ways, provided there is a large work to do. With a few trees, the bucket method would be best. But of course any artificial means is to be used only till the pollenizers can be grown.

The Underground Stems of Quack-Grass

THE underground stems are the seat of the remarkable vitality of quack-grass; therefore, for a full understanding of this subject the plant in its relations to the underground stems will first be briefly considered. These stems are often called roots. They are not roots in the true sense of the word, but rootstocks, that is, underground stems. The distinction between rootstocks and roots is that rootstocks have buds on them as stems do, while roots do not. Another very important distinction is that rootstocks do not absorb material from the ground, while roots do. The rootstocks are dependent for their growth upon the material absorbed by the roots and elaborated in the leaves in combination with the material which the leaves draw from the air. This material elaborated in the leaves then goes down to form the underground stems, or rootstocks. The plant is simply storing up material to draw on next year.

As the material for the growth of rootstocks comes from the leaves, the amount of leaf growth which the plant produces in any one season is largely a measure of the amount of rootstock growth. So, by limiting the development of top in any way the number of underground stems produced is thereby limited. If little or no top is allowed to grow very little rootstock will be developed. Just as we would expect a small crop of potatoes if we were to keep the top of the potato plant cut back close to the earth, so should we expect a minimum of rootstock growth to be produced by the quack-grass plant if its top is kept closely cut. By actual observations, this is found to be true.

The depeest and most vigorous rootstock development of quack-grass is found in cultivated fields. There are several factors which cause this. The principal one is probably deep preparation of the land. When the plant is left undisturbed the rootstocks have a tendency to get nearer the surface every year. Deep plowing puts the stem back to the bottom of the furrow, and a mass of tangled growth is then sent out toward the surface, a large part of the vitality of the buried stems going into new stems reaching toward the surface. This new growth lives until the next year. When the stems are buried deeply to begin with and cultivation is not kept up long enough to kill out the grass (and it usually is not on this type of land), the plant takes on a new lease of life after cultivation stops, the loose deep soil furnishing an ideal place in which to grow. As a consequence, the plant becomes firmly established and is well able to stand the next year's battle.

In midsummer, immediately after haying, there is usually a period of more or less relaxation from general farm work. This is a season of the year also when rootstock grasses seem to be at their lowest state of vitality. The hay crop, too, has been secured from the sod land and nothing more is to be produced the current season on these lands; therefore, no crop is lost. If the work is begun on pasture lands, at least a half season of pasturage has been obtained. It is only on sod and pasture lands that it seems to be advisable to attempt to destroy quack-grass by the method here outlined, as was pointed out in the discussion of the rootstock habits of the grass under varying field conditions.

The process of killing quack-grass on sod or pasture lands, beginning in midsummer, is a very simple one.

The first step is to plow the sod, cutting just under the turf, which is usually about three inches deep. To thoroughly turn over a stiff quack-grass sod as shallow as three inches it is advisable to use a special type of plow (Scotch bottom) having a very long, gradually-sloping moldboard. It has been found that with this type of plow the sod can be turned very shallow. The next step is to go in a week or ten days later with a disk harrow and thoroughly disk the sod. Repeat this treatment every ten days or two weeks until fall, when the quack-grass will be completely killed out.

It sometimes happens that with certain kinds of soil during drier periods in the summer the ground becomes too hard to plow. With the type of plow suggested, however, it has been found that very hard and dry sods can be turned. In case it is not possible to turn the sod on account of dry weather, the treatment can be given with the disk harrow alone. We have been able to thoroughly kill the grass with either the disk or the combination of plow and disk treatment. Where plowing is possible, however, it is usually cheaper to kill the grass with plow and disk than with the disk alone.

If the disk alone is to be used, it should be set practically straight, well weighted with bags of dirt, and the field gone over three or four times. The first two cuttings should be at right angles and the other cuttings diagonally across. The sod in this way is divided into small blocks. Then the disk is set at an angle, when it will be found that the first two or three inches of the sod, which contains practically all of the quack-grass roots, can be cut loose from the soil below. The exposure to the sun and the breaking loose from the lower soil soon kills out the quack-grass. This ground should be gone over at intervals of ten days or two weeks throughout the remainder of the season.

The following spring the infested land, on which the grass has been killed either by the disking method or by the combination of plowing and disking, should be plowed to a good depth in order to bury the mass of dead roots thoroughly. This will facilitate the cultivation of the spring crop. If the work has ben carefully done the quack-grass will not show up at all in the spring crop.

There is no closed season for rat-killing.

Save Wheat—Use Substitutes

MEASUREMENTS OF SUBSTITUTES EQUAL TO ONE CUP OF FLOUR.

These weights and measures were tested in the experimental kitchen of the U. S. Food Administration, Home Conservation Division, and of the U. S. Department of Agricultura, Office of Home Economics.

In substituting for one cup of flour use the following measurements. Each is equal in weight to a cup of flour.

Barley	1⅜ cups
Buckwheat	⅞ cup
Corn flour	1 cup (scant)
Corn meal (coarse)	⅞ cup
Corn meal (fine)	1 cup (scant)
Corn starch	¾ cup
Peanut flour	1 cup (scant)
Potato flour	¾ cup
Rice flour	⅞ cup
Rolled oats	1½ cups
Rolled oats (ground in meat chopper)	1⅛ cups
Soy-bean flour	⅞ cup
Sweet potato flour	1⅛ cups

This table will help you to make good griddle cakes, muffins, cakes, cookies, drop biscuits, and nut or raisin bread without using any wheat flour.

You will not need new receipes. Just use the ones your family has always liked, but for each cup or flour use the amount of substitute given in the table. You can change your muffin recipe like this:

Old Recipe—Two cups wheat flour, 4 teaspoons baking powder, ¼ teaspoon salt, 1 tablespoon sugar, 1 cup milk, 1 egg, 1 tablespoon fat.

New Recipe—1⅜ cups barley flour, 1 cup (scant) corn flour, 4 teaspoons baking powder, ¼ teaspoon salt, 1 tablespoon sugar, 1 cup milk, 1 egg, 1 tablespoon fat.

The only difference is the substitution for the wheat flour. Everything else remains the same. You can change all of your receipes in a similar way.

GOOD COMBINATIONS OF SUBSTITUTES

You will get better results if you mix two substitutes than if you use just one alone. Some good combinations are—

Rolled oats (ground) or Barley flour or Buckwheat flour or Peanut flour or Soy-bean flour	and	Corn flour or Rice flour or Potato flour or Sweet potato flour or Corn meal

CAUTIONS

1. All measurements should be accurate. A standard measuring cup is equal to a half pint.
2. The batter often looks too thick, and sometimes too thin, but you will find that if you have measured as given in the table the result will be good after baking.
3. Bake all substitute mixtures more slowly and longer.
4. Drop biscuits are better than the rolled biscuits, when substitutes are used.
5. Pie crusts often do not roll well and have to be patted in to the pan. They do not need chilling before baking.

They also serve who buy War Savings Stamps—if they save and buy to the utmost of their ability, and buy in time.

English Walnut Industry in the Northwest

By Knight Pearcy, Salem, Oregon

THE United States annually imports between 45,000,000 and 55,000,000 pounds of walnuts. These come from France, Italy and China, largely, the latter country selling us some 7,000,000 pounds of the so-called "Manchurian" walnuts; California produces between 20,000,000 and 30,000,000 annually, all of which is consumed in this country. Oregon produced between 70,000 and 100,000 pounds in 1917. The three Pacific Coast States are the only ones in the United States that can produce the English walnut commercially. California has in bearing some 35,000 acres, with 20,000 non-bearing; Oregon has a total of about 6,000 acres, a small per cent of which is in full bearing. Washington acreage is much smaller than Oregon's.

We are often asked if walnut culture is not still in the experimental in Oregon. There are less than 100 acres over twenty years in age in this region, and yet the performance of this small acreage has been such as to encourage the planting of some 6,000 additional acres. There can be no doubt that the walnut is here to stay and that the time will come when it will rank in commercial importance with the apple, prune and loganberry. While the walnut is grown successfully in every county in the Willamette Valley and in some, if not all, of the counties of Western Washington, there are nevertheless certain very marked limitations to its culture in these regions. Greater care must be exercised in selecting the site of a walnut grove than is necessary with most other orchards.

The walnut grows to be a very large tree, and to nourish it properly and to anchor it securely its roots must spread far and deep. Hence a fairly deep soil is necessary for the best results. The soil should be retentive of moisture but well drained, for this is a tree that refuses to do well when its feet are wet, especially when it is growing on its own root or that of the California black walnut. In draws and other places where the water table stands high in the winter months it is considered good practice to plant trees that are worked on the American black walnut root. However, where any considerable area of the prospective nut orchard has a high-water table it had better be avoided. It is on plantings on poorly-drained soils that "Die-back" is most common. Professor Barss of Oregon Agricultural College, in an address at a recent meeting of the Western Walnut Association, explained that among the causes of "die-back" are wet soils in spring. Wet soils prevent sufficient air from entering the soil, which hinders spring foliation. Proper absorption of water and plant foods will not take place unless there is a certain amount of air in the soil about the roots. In this case water transpires more rapidly from the upper part of the tree than it is absorbed by the roots. The inner parts of the tree get first chance at this water and the tips get what is left, and as a consequence many of them die back because of insufficient water.

Frost is the most important limiting factor to walnut culture in Oregon. Locations subject to late spring and early fall frosts should be avoided. The heavy frost that hit the Willamette Valley in September, 1916, cost those growers who did not have proper air drainage two crops of walnuts. It froze all the nuts on the trees at the time and injured the fruiting buds for the following season to the extent that there was a very light crop in 1917. Other plantings located with due respect to air drainage were uninjured. It is because of the better frost protection of the hills that the bulk of the plantings of the state are there planted. Yamhill County has over 50 per cent of the walnut acreage of the state. Washington, Marion and Polk, next to Yamhill, have the largest plantings. The larger part of the plantings of these counties is in the hills.

Generally speaking any land that is suitable for prunes is suitable for walnuts, provided that the soil is deep. The prune, however, will thrive on more shallow soils and will stand a higher water table. The same points that must be considered in deciding between a valley location and a hill one for prunes must be considered in the case of walnuts. In favor of the valley locations the following points are advanced. The heavier, more retentive and generally richer soils will produce a larger tree with more bearing surface and will grow a tree to a size capable of bearing commercial crops at an earlier age than is possible under hill conditions. The yield per acre, where other conditions are equal, will generally be greater as long as frost does not hit. However, one frost in ten years might more than equalize the increased profits of the heavier bearing lowland trees. It is more difficult to find proper depth of soil in the hills. The soils of these sections are generally less retentive of moisture, and as a consequence the trees are less likely to attain the great size of those valley

grown and will not reach a size necessary to bear commercial crops at as early an age as do the latter. While the main point in favor of hill orchards is the freedom from frosts it should be borne in mind that the mere fact of being located in the hills does not necessarily guarantee that there will be an immunity to frost, as there are frosty locations in the hills as well as in the valleys.

The walnut is generally planted with fillers. The Italian prune is the best filler for the Willamette Valley. It thrives on the same types of soil, its fruit can be dried in the same drier that drys the walnut, it forms a comparatively small tree and comes into bearing relatively young, yielding a profit before the nuts begin to bear heavily. Its fruiting season preceedes that of the walnut, so that there is no competition for labor between them, and the help can be given continuous work, going from the prune harvest to that of the nuts. The cherry, the pear and the apple make poor fillers. The filbert, however, shows signs of making an ideal filler. It comes into bearing as early as the prune and its crop is harvested and out of the way before the walnut crop is ready, and it endures shade better than most other trees. The filler should be removed as soon as the walnut tree begins to crowd.

On hill soils the nut trees are usually planted on fifty-foot centers on the hexagonal plan, with fillers set between, giving three fillers to every nut tree. On heavier soils sixty feet is none too great a distance. With solid plantings (plantings without fillers) the trees are often planted a little closer together. One of our leading growers spaces his trees at forty-foot intervals. He realizes that at maturity these trees will be too crowded to give maximum returns, but since he does not expect to live forever he figures that he will receive a greater average annual income per acre during his lifetime than he would were he to plant at fifty or sixty feet.

The age at which this tree comes into bearing varies greatly. The variety, the manner of cultivation and prnning and heading and other factors all have a bearing on the time at which a tree will start fruiting. Some trees do not start bearing until ten or twelve years old, while others bear much younger. Grafted trees average younger in coming into fruiting because no tree is considered worthy of propagation unless it has this character of earliness of fruiting.

We know of two orchards, one a grafted one and the other part grafted and part seedling, each of which yielded sixty pounds per acre at seven years of age. Another 25-acre piece of seedlings, when seven, eight and nine years old (it had trees of these three ages) yielded 5,000 pounds, and a year later 6,000 pounds. There were seventeen trees per acre here with no fillers. Another orchard at seventeen years yielded 400 pounds on seven acres, at twenty-one years two tons and at twenty-five years 1,000 pounds per acre. This planting was given poor care for years, but during the last few years has been well cared for, which care is reflected in the increased yields.

A prominent grower in the Dundee district, which is the leading producing district of the state, estimates that the average production per acre there, with orchards ranging between fifteen and twenty-four years of age, to be about 800 pounds per acre. However, he says that 25 per cent of the trees (it is a seedling district) do not yield enough to pay expenses and should be top worked with scions from good bearing trees. This would bring the average yield up close to 1,000 pounds per acre. These nuts sell ordinarily at from 14 to 17 cents per pound, but the last year the growers there received 20 to 25 cents.

There are no mature grafted orchards in the state, but it seems reasonable to figure that proper varieties of grafted trees should yield somewhat more heavily than these seedling orchards. In California, where both types of trees have been grown alongside for years, the grafted ones have so performed that most of the new plantings being set out are of this type of tree.

The newcomer to the nut game will hear a great deal of conflicting talk regarding the relative merits of the seedling and the grafted orchard. A brief sketch of the history of the English walnut on the west coast of America may be of interest while on this subject. The very first walnuts planted in Western America were of the hard-shell type, small thick-shelled nuts, that were planted in Southern California by the early Mission fathers. In 1867, a Californian, Joseph Sexton by name, purchased a sack of nuts, supposedly from Chile, on the Frisco market and planted them in Southern California. Of the 250 trees that he brought to a bearing age from these nuts, sixty produced nuts of the paper-shelled type, the remainder producing hard shells like the parent nuts. These soft-shell nuts, being so superior to their hard-shell parents, were planted in the nursery. When the resulting seedlings came to bear they were found to produce nuts of all types from hard shell to paper shell. Among these types was one intermediate between the hard shell and the paper shell. It was called the Santa Barbara soft shell. Seedlings grown from these soft-shell seedlings gave rise to the great walnut industry of Southern California.

A great deal of variation was apparent among these seedlings trees, some bearing heavier crops of better nuts than others. Many of the growers planted seed from these superior trees, but while this procedure gave a better average of desirable trees than where the seed was taken indiscriminately in the orchard, yet the variation in the resulting trees was too great and too few of the trees proved to be as good as their parents. Hence some of the better growers began the practice of producing trees by grafting seedlings with scions taken from the best trees in the orchards. In this manner they obtained trees that retained the characters of the parent trees. In this way Placentia Perfection, Prolific, El Monte and other largely grown California varieties originated. All of the trees of each of these varieties trace their ancestry back to a single tree which was propagated from because of its superiority over other seedlings. In each case the parent tree was a seedling.

Most of the new plantings in both California and Oregon are of grafted trees. Few well-informed growers are recommending the planting of seedlings. However, the mere fact that one

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BETTER FRUIT

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Diversified Horticulture.—Recent developments indicate that the horticulture of the Pacific Northwest is becoming more and more diversified. As an indication, the recent demand for Black Currants for jam purposes and the recent activities of the quartermaster's office of the army in purchasing dried fruits and vegetables indicate a development along diversified lines. The operation in Oregon alone of over thirty canneries and evaporators means that we are producing a great variety of horticulture plants, all of which is indicative of a very wholesome development of our horticulture. We have become world famous because of the excellence of our apples, pears and prunes. We bid fair to become equally as famous because of the excellence of our berries, including strawberries, loganberries, evergreen blackberries, red and black raspberries, red and black currants, also our walnuts, filberts, sweet cherries and a long list of vegetables especially adapted for evaporation and canning. Truly we are rich and our horticulture is bound to ever increase and to become a more and more important factor in our agricultural development.

Fruit Export—The war has paralyzed to a large extent our export trade of fruit. It is gratifying to know that the Office of Markets in the United States Department of Agriculture has been investigating the Oriental market as a future outlet for our fruits. We shall look eagerly for reports concerning such investigations. The Pacific Slope is very well situated for a development of an export trade not only with the Orient but likewise South America. Every effort should be made at this time to study the South American market and thus be prepared to utilize it at once as soon as the war is over. It will mean much to the apple growers of the Pacific Northwest if direct trade relations would be opened up between such ports as Portland and Seattle and South American ports rather than having to deal direct with New York, as is now the case. Let us ever be on the alert to establish new markets and to strengthen the present outlet for our fruit.

ROAD WORK IS WAR WORK

"Speeding up construction of good roads is an integral part of government war work. Efficient transportation is necessary to reduce the margin between producer and consumer."—U. S. Food Administration.

The United States Department of Agriculture, recognizing the value and importance of fertilizers as factors in the food supply of the nation, urges the fruit growers and farmers to estimate their fertilizer requirements now and place their orders at once. This will enable dealers to combine their orders into full capacity carload lots. Last year many fruit growers were late in ordering spring fertilizers, and did not receive them until after planting time, and some failed to get them at all. There was never a time when the use of fertilizers was so profitable as it is now, with every product of the soil bringing very high prices and also because of the shortage of labor. By using fertilizers intelligently fruit growers can largely increase their crop production. So we urge every fruit grower to place his orders early. The railroads are now being operated by the United States Government, and by ordering early you will be co-operating with your government. It is also urged that bigger fertilizer bags be used. Burlap is growing scarce because of its increased use in the trenches and because of the shortage of shipping facilities, because the jute from which burlap is made is imported from India. It is therefore necessary that the use of burlap for carrying fertilizers should be cut to the greatest possible extent. Every patriotic fruit grower will gladly co-operate by ordering larger bags.

When you buy War Savings Stamps you do not give your money, you loan it at 4 per cent compounded quarterly. You help your Government, but you help yourself even more.

The Government needs your money; you need the stamps.

The Closer Relation of Horticulture to the Cannery

By A. Rupert, Portland, Oregon

OREGON as a whole is not alive to all the posibilities in the canning business; this, in my opinion, applies to the grower as well as the banker and business man throughout the state, and there is a very good reason for it.

Many years ago, as you know, there were many canneries started by machinery-selling houses who knew nothing of the canning business or what it took to support a cannery. These plants of course were all doomed to failure before they started, and naturally the people became discouraged and became skeptical. The growers, however, being somewhat alive to the situation and knowing they needed something in the way of a plan to work up their products from the farm and give they a permanent market close at hand went ahead and organized a cooperative association, putting in one of their own number to manage the plant, and went out and got a man for processor or superintendent, who probably had slight experience in some capacity in some particular plant, but in nine cases out of ten was absolutely unfitted to superintend the canning of the product, and usually totally unfitted to handle the machinery in the plant, which is very important. These people without any selling organization or knowledge of the business on either the marketing or canning end were of course doomed to failure, and many a grower who had been enthusiastic in building up something for his own good had to face a heavy loss. Naturally, everybody who had watched these operations again became skeptical and positively indifferent to the canning business as a business in the future. Gradually, however, these institutions discontinued, except those that happened to learn by experience or had people more able to manage than their unfortunate competitors, so that today the canning business is practically in the hands of experienced people knowing the business on both ends, but there are still many things to be desired.

Oregon is undoubtedly the home of the loganberry, which berry as the canned article has had many ups and downs, but I believe it is on the path to success at this time, that is, in a limited way, and there is no doubt but what all the tonnage that will be available in Oregon at the present time will be used for canning, loganberry-juice making and dried loganberries, but there would be a calamity if the loganberries were planted on an unlimited scale, as it would again drug the market the way it did years ago. We are hoping this will not be the case, but a reasonable addition would not be unsafe, and I believe that these additions in a way are being accomplished. We understand there has been quite a little new acreage planted out in 1917 and 1918, and there will probabaly be quite a little acreage planted this fall or next spring.

Red Raspberries. — The only large acreage of this very much-desired fruit is in Multnomah County, with a small acreage in Lane County, and a few

plantings in Yamhill County, in addition to Newberg. These berries could be planted and developed to a very much larger extent in Oregon in localities where soil is suitable for its growth, because we believe that the acreage in Oregon could be doubled with entire safety.

Black Raspberires.—This article is being much more sought after in the Western country on account of the large acreage discontinued in the East, particularly in New York State and Michigan, and some parts of Oregon are well suited for development. There is a large acreage in Yamhill County, but very little anywhere else in the state.

Pears.—Oregon, and particularly the Willamette Valley, is very well suited for the horticulture of Bartlett pears, and quite extensive planting of this fruit would be a big addition to the canning industry, and also believe that they are about as good a crop as a horticulturist could plant.

Royal Anne Cherries.—There is a large acreage of this fruit available throughout the Willamette Valley, The Dalles, Hood River and various parts of Oregon. I believe there is approximately enough of this fruit now in bearing, and coming into bearing, to take care of all the canner's needs.

Strawberries.—The growing of this fruit has been largely discontinued throughout the state on account of various pests that destroy the plants, also on account of low prices prevailing some few years ago. We, however, believe there is money in the strawberry business to the growers, providing the right varieties are planted and developed. Of course everything depends on the proper soil for the proper fruit and intelligent advice along this line should be given by the people most interested, namely, the canner.

Our plant at Newberg, namely, the Valley Canning Co., maintains a school for its growers where the growers meet and discuss matters of interest to the grower and horticulturist. This hall was built by the company and dedicated to its growers for this purpose, and we believe it is one of the best investments the company could possibly make, and I would strongly advocate other companies following the same plan.

Closely related to the fruit business is the vegetable business, in which I believe Oregon excels even more than it does in its fruit, and there are many thousand acres within the State of Oregon of the best vegetable land anywhere in the world. Along the Columbia River, for one hundred miles, is the best vegetable-built land that I know of anywhere in the world, and they are

largely undeveloped, at least where the development affects the farmer; this must be gotten to in some way. If this could be done it would add enormously to the population of the state, as I do not believe that the East would be able to compete with us on vegetable growing, providing it was put on the proper basis.

Our companies in which we are interested and are selling agents for are now selling all sorts of vegetables everywhere throughout the United States, and we have shipped many vegetables and fruits to foreign countries. For instance, at this time we are making shipment of a small quantity of vegetables to Samarang, Java. There are many places in the world where vegetables such as string beans, carrots, parsnips, turnips, boiled cabbage, sauerkraut cannot be obtained in the fresh state and are not now large users in the canned state, but it can be developed.

Again, it is our opinion that New York State, Michigan and several of the other states that used to be enormous producers of commodities for canning factories are gradually going out of the business, and will keep going out at an enoromus rate in the future, and I do not believe they can compete with this country on the growing of berries, neither do I believe that they can compete on the growing of vegetables.

The horticulturist, vegetable gardener and farmer are indispensable to the canner. It must be that these people are on a basis where they can make money else it is true that the canning business would be valueless, and unless the people produce the stuff he cannot operate his plant. We are as much interested in his success as we are in the success of the plant, and we are looking at all times to find crops we can raise that will show us a profit and on which we will be satisfied to produce every year so as to make the business stable and solid. However, a canning business needs a large production; for instance, at our plant at Newberg we could use double the stuff we have in production now, and the same applies to the plant at Eugene. Either of these plants could handle fifty to sixty tons of raw material per day; and it takes an enormous production to keep a plant like that going for a long season.

These plants also represent a large investment and must be kept busy as many days in the year as possible in order to show returns, because it is necessary to handle a wide variety of products covering the season's operation, and anything that BETTER FRUIT can do to stimulate production along the proper line should be very much appreciated by the canners, and we know it would be appreciated by the growers.

Return of Peace Means to Apple Industry

By Gordon C. Corbaley, Executive Secretary Seattle Chamber of Commerce and Commercial Club

THE General Manager of the Northwestern Fruit Exchange, Mr. W. F. Gwin, has furnished me with the best answer to the question involved in this article. He says:

"I don't know. All precedents have been swept aside and rendered worthless. We face an entirely new situation, the complexion of which and the exact development of which no man can foresee. We have our opinions of how things are likely to develop, and that is all."

The effect of peace on the apple industry depends largely on the condition of business in the United States. Our Northwest apples are largely sold as a luxury, and are therefore peculiarly liable to business depression and hesitation.

Nobody has any real idea as to what will be the exact condition of business during the first days following the coming of peace. It will be a period of hesitation and uncertainty. That will be because nobody will know what is going to happen. This uncertainty will be particularly marked because about half of the entire productive capacity of the United States will be devoted wholly to war purposes. The release of the billions of money and millions of employes from this war work will naturally make unsettlement.

The period of hesitation and unsettlement is capable of almost any outcome. A great deal depends on the financial condition and the mental condition of the people. They perhaps will be so depressed and worried and seared that capital will run to cover, and we will have a smash.

I, personally, do not think so. I believe that the wide distribution of government bonds will be one of the most valuable influences during these first few months of uncertainty. The return of peace will mean an immediate strengthening of the value of government securities. There will not be a boom in Liberty Bonds, but there will be an appreciable strengthening of value that will put confidence into the many millions of citizens who will have their liquid capital tied up in these securities.

All that we will need as a people to bring us out of this period of uncertainty in an aggressive, forceful frame of mind will be a reasonable measure of encouragement. Once we are no longer in doubt business will go ahead more rapidly than ever, because we will have untold billions of capital available to invest in development in all parts of the war. I refer not only to the capital that has been engaged in war industry, but also to the many billions of capital that we will have stored up in government bonds.

The whole world is on an inflated basis. I think that we are going to travel on an inflated basis for many years to come. That means high prices for everything, and high prices with plenty of money form the ideal conditions for our fancy-apple market.

I think that Mr. Ford asked me this question with the idea of leading the way to a discussion of foreign markets rather than for the purpose of giving me an opportunity to discuss economies. He knows our tremendous interest in Seattle in foreign trade, and he naturally judges that the foreign market is to become a constantly increasing factor in the distribution of our boxed apples.

The best analysis that I have been able to get of the general foreign situation comes from our old friend, H. M.

Gilbert of the Yakima Valley, who says:

"The world is going to be much more of a family of nations after the war. In rebuilding and reconstructing I look for a very active demand for fruit, as well as for all other food products. There will certainly be a big demand for labor and we shall have good times, I take it, much as they do when a city is rebuilding after a big fire.

"This will be especially important on the Pacific, because Japan and China are now awakened and will want to trade with us more than ever. They will want all the modern improvements of railroads, electric machinery, and the other inventions of the West."

When I spoke of the former foreign market for our apples as having been of little importance, I have in mind no disrespect to our export apple business or the men who are engaged in it. It is true, thus far, we have sent abroad only a small percentage of our fancy apples, say 5 to 10 per cent of the fancy and extra fancy stock, depending on the year. The foreign trade has been nothing but a saftely valve to help take the pressure off the domestic markets.

This is not alone true of the apple business. It pretty accurately describes the condition of almost all American exports, except the great staples. As a people, we have used the foreign markets to help have an outlet to make possible the furnishing of a more even supply to the really important markets within the country.

After the war this will be different. The whole world has been brought closer together. The United States has become the financial and industrial center of the world. We have shown ourselves much too big to ever be able to again stay within our own boundaries. We will certainly sell to the rest of the world and buy from the rest of the world in much larger volume and in a much more direct way than we ever have in the past.

Perhaps the greatest single influence in bringing that about will be the new American merchant marine now in process of creation as a wartime necessity.

At the beginning of the war we were forced to depend on the ocean trade channels of other countries. Very little business moved direct from the United States to distant lands, and hardly any ocean transportation was handled by American lines.

Under the war shipbuilding program the United States by the end of 1919 will have as great a tonnage afloat in foreign trade as will Great Britain, and we will surpass Great Britain as a peace sea power, because more than 90 per cent of our tonnage will be government owned and available to be operated for the purpose of developing American trade lines to every corner of the world.

This will present an indeed fortunate situation for us, coming at a time when we will want to do business with every country in the world and every country in the world will want to do business with us.

Now, just what will this mean to the apple business? In general terms, it

will mean an enormous possibility for expansion that will depend in a considerable measure upon our being organized to take advantage of it.

It is difficult to say just what it will mean in terms of business with individual countries. At the present time we have practically no export business. There is plenty of demand for our fruit, but, for various reasons, we cannot get the fruit there to supply the demand. Prosperous England could use any quantity of small red apples and Yellow Newtowns if the English government could be persuaded that our apples are not a luxury and would lift the embargo. The Scandinavian countries and South America are literally crying for apples and offering all sorts of inducements, but there is practically no ship space to be had. Australia, always heretofore a dependable outlet for our early Jonathans, is closed with an embargo.

The individual markets open to our apples in the different countries will depend in a large measure on the conditions in those countries. Personally, I think that nearly all these markets will be favorable.

Europe offers the largest question of doubt, because Europe is so intensely in the middle of the war that nobody knows what it is going to look like when the struggle is over. Personally, I believe that the releasing of men and capital from war occupations and the turning of government finances to the spending of anywhere from ten billion to twenty billion dollars in reconstructing the damaged places will produce a condition of great activity.

One element very much in our favor will be the fact that European orchards have been negelected during the war, and those that have not been entirely destroyed will show a low efficiency in production.

Another pleasant element will be found in Russia. Some day in the not distant future Russia is going to complete its own present occupation of blowing off steam accumulated during years of repression, and will move into a period of expansion and development that will draw much of the money and man power of the world. Russia will be a good market for our apples.

Personally, I look for a tremendous expansion in the Orient and in Australia. We will see a great outpouring of capital and of men to the new places of the world. That has come after every great war. The greatest new places of the world are Siberia, with its billions of acres of untouched resources, and China with its hundreds of millions of undeveloped labor reserves.

Perhaps also in this list should be specifically included Australia, which is due to expand, although not in as great a measure as Siberia and China. Australia, you will remember, is bigger than the United States, and is capable of some expansion and development, even if it does not approach Siberia, which is more than twice as big as the United States.

We of the United States are especially interested in all the development around the Pacific, because Siberia and China will draw their supplies through the northwestern part of the United States, and Australia is a market in which we have a direct interest. They take our low-colored early Jonathans that are mighty hard to market any place else, and we wish they would have a period of development that would cause them to take many thousands more of them.

As I look at this entire world situation I find that it is impossible for me to be pessimistic. Perhaps I am so constituted that it is not practical for me to be pessimistic very long at any time.

But it is pretty hard for an American citizen to be pessimistic at this time, when the center of the world is swinging to the Western Hemisphere; when we are about to become the old world and when Asia is about to become the new world.

We Americans in this day of change and stress are getting a better understanding of each other, and I believe we are going out collectively to serve the markets of the world.

I believe that the question as to what foreign markets will mean to the boxed-apple business during the days immediately following the war will depend in a very large measure on our ability to organize collectively to develop these foreign markets in a big way.

Big things will have to be done if we are to develop these markets rapidly. Chances will have to be taken and some mistakes will be made. These chances will be much better taken and we will do business much more efficiently if all the big factors in the boxed-apple business will pool their foreign trade into one big export corporation.

That is a lesson that the European nations learned before the war. It is a lesson that the war is teaching to America. The big factors in the apple business of the Northwest will please take notice.

War Savings Stamps save lives.

Biscuit, Using No Wheat

Corn Flour Biscuit.—1 cup liquid, 2⅔ cups corn flour, 3 tablespoons fat, 6 teaspoons baking powder, 1 teaspoon sal. Appearance, good; texture, very dry and close, although not heavy; color, white; flavor, slight corn flavor; comment, most nearly the appearance of wheat biscuit of any of the substitutes used.

Suggestion.—If 1¼ cups liquid are used the texture will be better, but it will have to be made as a drop biscuit.

Corn Flour-Rolled Oat Biscuit. — Ground rolled oats 50 per cent, corn flour 50 per cent, 1 cup liquid, 1⅓ cups corn flour, 1 cup ground oats, 3 tablespoons fat, 6 teaspoons baking powder, 1 teaspoon salt. Appearance, rough, but appetizing; texture, light; flavor, very good; color, slightly dark—attractive.

The English Walnut, Etc.

Continued from page 11

buys a grafted tree does not guarantee that he is getting a superior tree. The grafted tree will be superior only in acse the tree from which the scions were taken was superior, for it will have the characteristics of the parent tree, whether they are good or bad. The point we wish to make is that a tree is not necessarily a superior one simply because it is a grafted one. A hundred grafted trees may be grown from scions taken from a single tree and the resulting trees will be quite uniform in all respects and will all have the same characteristics as the original tree, but if a hundred seedlings are raised from nuts taken from the same tree the resulting trees will show great variation in every respect. Some of the trees may be the equal of the parent tree, a few may be superior, but a large part of them are certain to be inferior. These inferior trees must be gone over and top worked with scions from good producing trees if the orchard is to be made most profitable.

It has been estimated by excellent authority that among the California seedling groves 25 per cent of the trees do not pay their keep, another 25 per cent just do pay and the remaining 50 per cent make what profit that is made. Arguments in favor of the seedling orchard are several. The initial cost of the trees is less. The question of pollination does not have to be considered as it does in solid plantings of one variety. There is less chance of a single frost nipping the whole crop because of the fact that the wide variation in blossoming time of the seedling will allow a certain per cent of the trees to escape.

The Franquette is the most widely planted variety in the Northwest. It is an old French variety that has been grown in California for nearly half a century. It has been more thoroughly tested out under our conditions than any other variety, and while it is not the ideal nut it is probably the best nut to plant under Western Oregon conditions. Without doubt the leadership of this variety will in time be questioned by other varieties, some of which may now be growing as seedlings and others which may be already named varieties but which have not as yet been well tested out here. Our ideal nut should have the superior quality of the Franquette but should blight a little less, come into bearing a little younger and yield a little heavier, but in the present state of knowledge, we know of no other variety that we would plant in its stead.

The Mayette is perhaps the second in importance of the named varieties grown in Oregon. However, Mayette seems to be more of a type than a variety, as sold by nurserymen at present. There is too much variation, particularly in yield, in the various trees of this variety, although there are some that seem to be of great promise. It will probably not be largely planted until some of the best strains of the

type are segregated and are propagated by reliable nurserymen.

The question of pollination is one about which there is practically no accurate information. It is not known for certain which varieties, if any, need the pollen of other varieties in order to set fruit. In planting grafted varieties it is safer to plant more than one variety in the orchard. There is one evidence that the Franquette can be planted in solid blocks safely, but until this is established for a certainty it is a good policy to plant at least ten per cent of some other variety with it. Of course, it is necessary to use for this purpose a variety that sheds its pollen at the time that the pistillate blossoms of the main variety are receptive. Controlled experiments are being carried on in some Oregon orchards this summer that may throw some light on this important subject.

There can be no doubt that a walnut orchard, properly planted in a suitable location and properly handled, is a good investment. It is, at the same time, possible to lose a lot of money by planting in poor locations and by using varieties unsuited to our conditions. The prospective planter should get as wide a variety of advise as possible before planting. Don't bank too much on any one grower's statements nor on the record of any one grove.

Sending Workers to France

The commander of a Western camp who went abroad for a tour of inspection and observation was never known for his enthusiasm about the athletic activities in his camp until he came back from France. Then he announced that until he was retired by the government, play was compulsory for the men in his command, whether the country was at war or peace. What this general saw in France has been described by Dr. Luther H. Gulick, head of the Y. M. C. A. committee on recruiting athletic directors for overseas service.

"The winning of this war is as much in the hands of the athletic and physical directors of the Y. M. C. A.," says Dr. Gulick, "as it is in the hands of any other single group of men except the commanding generals. We have sent overseas recently such men as Dave Fultz of Brown, famous as an athlete in his college days and more recently as an official in important intercollegiate contests; Frank Quimby, known to all Yale men as a successful baseball coach, who left his position at Andover to train regiments; Jack Magee, who brought athletic fame to that famous little Maine college, Bowdoin; Sparrow Robertson, newspaper man and expert in the construction of playgrounds, and scores of others of similar calibre.

"But we are confronted with even greater problems than ever before. Our army in France is expanding rapidly. Those boys over there want as many of the things they had at home as we can give them. More than that, they want relaxation from the strenuous tasks imposed on them.

"When a man has been fighting for days without interruption; has had prac-

tically no sleep and none too much to eat; has been marching or running, carrying weight, helping to drag guns and the like; he has been doing work which makes football seem like child's play. And he wants to play football, or baseball, or anything that will get his mind away from the terrible scenes which he has witnessed. Under such conditions a man frequently goes wrong. It is natural that he should lose control of himself. The 'Y' is there to see that his relaxation is of the right kind. The physical director, thoroughly trained and with a big personality, can give invaluable service.

"If we had all the trained men above draft age we still would be short. We must therefore take men of very little training and experience and give them all the training we can in a short, intensive course. Then they go to France to direct mass athletics. The games in which all can take part are those most in demand on the western front. Boxing is a blessing, and baseball is next in popularity. Thousands of bats and balls have been sent overseas, hundreds of mitts and gloves have been worn out, and, strange as it may seem, there is a constant demand for rule books."

Dr. Gulick states that American athletics are becoming tremendously popular in the French armies. President Poincare and Premier Clemenceau of the French republic have urged the Y. M. C. A. to send thirty directors to the French armies in the belief that their work will achieve wonderful results in holding the morale of the poilus who have seen four years of hideous warfare.

Loganberry Culture

By J. P. Aspinwall, Brook, Oregon.

The loganberry is not particular as to soil so long as it is not too flat and standing full of water. The richer and better drained the soil the heavier will be the yield, for it is a good feeder. The soil should be thoroughly prepared before the plants are set out. Plowing in the fall or early winter is best, then re-plow and put in shape in the spring after the ground has dried sufficiently so it will not pack. Be sure and get good plants from a reputable grower, for it is very hard to get plants started after the first year, and a poor start is worse than no start at all. The plants are generally set eight feet apart each way with the rows running north and south, so the sun will get an even chance at each side of the row. Thorough cultivation should be kept up till the vines are too long to permit it any more. It is then a good time to set the posts and put on the wire. The posts are set four hills apart in the row and the end ones are anchored securely. Seven-foot posts are used, set two feet in the ground. Three No. 12 wires are generally used for a trellis, the first one being placed on top of the posts and the other two spaced one and two-thirds of the way to the ground. Some use only two wires where they do not get a good growth of vines, and don't put the top wire quite so high. In October or November the vines are

trained on the wires and the ground plowed toward them, leaving a dead furrow between the rows for drainage during the winter months. In the spring the land is plowed away from the vines, being careful not to get the last furrow too deep, as that would injure the roots. Level cultivation is practiced during the summer to keep up as much moisture as possible. Keep the green shoots trained or tied in so they will not be injured while cultivating. As soon as the crop is harvested the old canes should be taken out and in September or October the new vines trained onto the wires for the next year's crop.

Proposed Increase, Etc.

Continued from page 3.

the tariff, and naturally protection is only afforded as far as Chicago.

For the past two years the railroads have been unable to furnish sufficient refrigerator cars to handle the apple tonnage, forcing the shippers to use box cars. The carriers refuse to insulate or otherwise protect box cars and also decline to assume any risks in transit, accepting billing only under Option 1 or shipper's risk. During the period August 15 to December 15, 1917, the Northwestern shippers used 2,290 box cars, insulated them at their own expense, in many cases sending messengers along with the shipments, again at their own expense, and paid the regular tariff rates, which contemplated refrigerator cars when the rates were established.

The industry is in a position where it cannot possibly stand another cent of increase. The growers are patriotic, and willing to do everything in their power to win the war, but they believe and know that the money which must be raised by freight increases must be raised from some commodity which can stand an increase—and apples do not come under that head.

The proposed rates are not only confiscatory, but also discriminatory and unjust, as is conclusively sustained by a comparison with rates to be prescribed on other products of this district, as shown in Table III, especially when increased values resulting from the war are considered.

This proposed increase in freight rates will apply to everything the growers use, such as nails, sprays, paper, etc., as in practically every fruit district on the Coast this is controlled in such a manner that the grower pays the freight.

The lumber interests have been well organized and their rate will be increased but 5 cents per hundred, which is probably due to their splendid organization. If it is through lack of organization that the fruit growing industry of the Pacific Coast will practically be crippled, it is time for the fruit growers to wake up and to organize, so as to be able to meet such an emergency.

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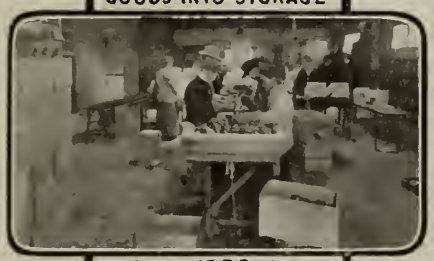

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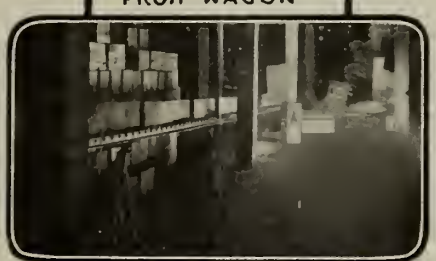

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